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10/598,592

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Juan de la Cierva Hoces

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09/02/2008

COLLEN IP
THE HOLYOKE MANHATTAN BUILDING
80 SOUTH HIGHLAND AVENUE
OSSINING, NY 10562

EXAMINER

GREEN, RICHARD R

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/598,592	Applicant(s) DE LA CIERVA HOCES, JUAN	
	Examiner Richard R. Green	Art Unit 3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-12 is/are rejected.
- 7) ☒ Claim(s) 4 and 13-19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "braking and rotor clutch means" and "transmission between the engines and the rotor" of claim 7 (line 3) and implied in claim 1, control system of claim 8, and various redundant means of claims 10 and 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "shroud 23" (page 10, line 28, not in figure 7 as described).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "20" in figs. 1 and 4.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

The disclosure is objected to because of the following informalities:

Reference is made to claims 2-5 (page 7, line 26) and claims 8-19 (page 8, line 8). Applicant is advised that the numbering of the claims may change throughout prosecution of the case and additionally that the claims exist as part of the specification, making the reference unnecessary and potentially misleading if it is not amended as prosecution on the merits progresses. The examiner recommends that references to specific claims be removed.

On page 10, line 24 it appears that an error in translation has left the sentence vague by substitution of the term [unintelligible].

The specification on page 11, lines 22-25 describes a geometrical relationship that cannot be understood by the examiner, as will be discussed in more detail regarding the 112 rejection to claim 1 below. Likewise, page 12, lines 23-25 include phraseology from claim 8, later rejected under 112. In both cases, the most expedient correction would be to amend the specification in the same manner as the claim.

The action of page 14, lines 34-35 uses the phrase, “deploying both blades forward,” when as best understood, a change in pitch of the blades is performed. The current language implies rather that the blades are being swept forward, when they

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have just been swept backward, and in any case a swept-forward arrangement is not shown in the figures.

Appropriate correction is required.

Claim Objections

Claim 12 is objected to because of the following informalities: "x-by-wire" is not understood to be a common term in the aeronautical art. Appropriate correction is required.

Claims 4 and 13-19 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is not clear from the specification, claims or included drawings how the aircraft control

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elements function in their usual manner without any mechanical elements, such as motors or servos, between them and the control levers. The examiner believes that the applicant means a fly-by-wire system, but as presently worded the claim has not been sufficiently enabled.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 5-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 7, the geometrical relationship in lines 20-21 "...until their longitudinal axis is aligned with the direction opposite that of the aircraft's movement," (lines 27-28 for claim 7) is unclear. The direction opposite that of the aircraft's movement is understood to be parallel to the fuselage and pointing opposite the direction of flight, and the longitudinal axis of the rotor is understood well enough, but it is not understood how an axis can align with a direction opposite another direction. What it seems to mean literally is identical to it being aligned with the direction of the aircraft's movement, that is to say, aligned with the longitudinal axis of the fuselage, but the examiner does not believe this to be what is meant, since the disclosure indicates an arrangement nearly perpendicular to the longitudinal axis of the fuselage, which is how this limitation has been understood.

Regarding claim 5, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 10 recites the limitation "redundant safety elements" in the second line. There is insufficient antecedent basis for this limitation in the claim. No first safety elements have been introduced, so it is not understood what is redundant or how.

Claim 11 recites the limitation "redundant computers, sensors and actuators" in the second line. There is insufficient antecedent basis for this limitation in the claim. No first computers, sensors or actuators have been claimed, and so it is not understood what functions they are redundantly performing for purposes of application of art. For the purposes of examination, any of these devices will suffice.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "of the 'fly-by-wire' or 'x-by-wire' type" does not distinctly limit the claimed control system. For instance, it is unclear whether it merely contains some wiring, such as electronic wiring from the cockpit to a hydraulic servomotor in the control surface, or whether it contains nothing but wiring, employing electromechanical servomotors.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **1 and 5-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over US-2964263 to Arena in view of US-3647315 to Rostad et al. (hereafter Rostad).

Regarding claim 1, Arena teaches an operating method for a convertible aircraft equipped with a fuselage (fig. 1, at 11), standard fixed wings (fig. 1, at 12), a tail unit with rudders (fig. 3 shows a rudder on the tail at the rear), propulsion engines (fig. 1, at 13), a rotor with blades (fig. 1, at 20), a transmission between the engines and the rotor (figures 7-8), equipped with braking and clutch means (col. 1, lines 33-40 describe a clutch and its use, and col. 2, lines 35-65 teach one form of braking means, insofar as the device disclosed would act to brake the rotor in its rotation), a landing gear (fig. 1, at 14), characterized in that the method comprises a direct and reverse transition from helicopter mode to gyroplane mode and a direct and reverse transition from gyroplane-helicopter mode to aeroplane mode (col. 1, lines 20-40 describe the helicopter-gyroplane transition directly and in reverse and that the helicopter/gyroplane-aeroplane transition takes place in reverse, though they are considered to take place directly in order for the aircraft to ever be reusable, even if they take place on the ground after the aircraft has landed. A ground-based transition is not precluded by the claim as written), the direct transition from helicopter mode to gyroplane mode comprising the following stages:

declutching the rotor from the rotor's propulsion engines (col. 1, lines 23-40),

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and the direct transition from gyroplane-helicopter mode to aeroplane mode comprising the following stages:

adjusting the collective and cyclic pitches of the blades of the rotor to essentially zero degrees (figs. 1 and 3 show the blades at essentially zero degree pitch), in such a way that they cease to lift and control the aircraft and the latter is controlled by the ailerons and the rudders (a helicopter with rotors at zero degree pitch is understood to produce no lift, and in such a scenario, the control of the aircraft would be left to whatever other control surfaces were left);

quickly reducing the rotational velocity of the rotor using the brake thereof (though Arena teaches the conversion from aeroplane to helicopter/gyroplane and is largely silent on the conversion from helicopter to aeroplane, it is understood that the invention is meant to be reversible in order to reuse the craft, and that such a conversion would require the reduction of rotational velocity of the rotor to zero, using a brake thereof, such as the latch means 30 in fig. 5, which when deployed would act to brake the rotor in the transverse position);

stopping the rotor in a transverse position of at least two of its blades in a position essentially transverse to the direction of flight (since this is taught to be the position for the blades in fixed-wing operation, it is understood that the rotors must be stopped in this position, such as by the mechanism described previously);

retracting the rotor blades toward the stern of the aircraft (col. 3, lines 40-43 teach that the rotor shaft can be actuated forward. In the scenario wherein the rotors are spinning and the shaft is actuated forward, in order for the conversion to fixed-wing

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to take place, the shaft would have to return to vertical, which involves a movement of the blades to stern);

rotating at least one of the rotor blades to approximately 180 degrees on its pitch axis (col. 2, lines 66-69 teach this process in reverse; it is understood that in order to return the wings to the fixed-wing position, the process would of necessity be performed in reverse);

deploying the rotating blades, independently from one another, to an azimuthal position determined by a pre-determined range of angles (a reversal of the deployment of col. 3, lines 7-14 to return the wings to fixed-wing flight would require an independent deployment of each blade to a pre-determined azimuthal angle required by the fixed-wing berthing apparatus visible in fig. 5, this process being performed by the mechanisms of figure 8); and

adjusting the angle of attack of the deployed rotating blades in such a way that they are placed on the aircraft's standard fixed wings (they are shown to be placed on the aircraft's standard fixed wings in fig. 5; whatever necessary adjustments to the angle of attack are considered to have taken place given that the limitation requires only those adjustments necessary to achieve this position),

and the reverse transition comprising the steps above executed in reverse sequence and with the opposite actions (Arena actually teaches the above steps in reverse, as has been described and is taught in columns 1-3 of Arena).

Arena is silent on ailerons disposed on the fixed wings, however Rostad teaches a convertiplane with ailerons (Rostad fig. 1, seen on the trailing edge of the wings at

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20). It would have been obvious to a person of ordinary skill in the art at the time of the invention to include ailerons as in Rostad on the fixed wings of the aircraft of Arena to control the flight of the aircraft in fixed-wing operation.

Regarding claim **5**, Arena provides a range of angles that are considered to comprise 30-60 degrees, as the range of angles allowed by the mechanisms of figure 8 include these angles.

Regarding claim **6**, Arena teaches the step of adjusting the angle of attack of the deployed rotating blades in such a way that they are placed on the aircraft's standard fixed wings comprising arranging the blades in the form of a biplane with respect to the standard wings (fig. 1).

Regarding claim **7**, Arena teaches a convertible aircraft of the type that comprises a fuselage, fixed wings, a tail unit with rudders, propulsion engines, a rotor with blades, a transmission between the engines and the rotor, equipped with braking and rotor clutch means, landing gear and transition means from helicopter mode to gyroplane mode and vice versa (this has all been described regarding claim 1), characterized in that the rotor is equipped with driving means for the direct and reverse transition from gyroplane-helicopter mode to aeroplane mode, which comprise:

an engine for the regulation of the collective and cyclic pitches of the blades of the rotor to essentially zero degrees, in such a way that they cease to lift and control the aircraft, and the latter is lifted and controlled by the ailerons and the rudders (figs. 7-8, particularly fig. 8 shows an engine regulating the pitch of the blades of the rotor, and it is considered capable of these intended functions);

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means to stop the rotor in a transverse position of the blades in a position essentially transverse to the direction of flight (the latch mechanism designated as 30 in figure 5 is considered capable of stopping the rotor in a transverse position of the blades essentially transverse to the direction of flight);

an engine to retract and deploy the rotor blades towards and from the stern of the aircraft, which allows to retract the blades and deploy them to an azimuthal position determined by a pre-determined range of angles (the crank at 54 in fig. 8 is considered an engine capable of retracting and deploying the rotor blades to an away from the stern of the aircraft, in that the blade is generally closer to the stern when it is flat than when it is vertically oriented. Moreover, the crank should allow the blades to attain any pre-determined angle or range of angles); and

an engine to rotate at least one of the rotor blades to approximately 180 degrees on its pitch axis (fig. 8, the crank at 54 is considered an engine capable of this, and this action is taught in col. 2, lines 66-69).

Arena is silent on ailerons disposed on the fixed wings, however Rostad teaches them in a convertiplane (Rostad fig. 1, at aft of wings at 20), and it would have been obvious to a person of ordinary skill in the art at the time of the invention to include them in the aircraft of Arena to control the flight of the aircraft.

Regarding claim 8, Arena teaches a control system for the various stages of the different transitions, comprising the clutch of col. 1, lines 27-40 and the mechanism of figures 7-8, wherein the pilot controls the pitch of the blades by turning the crank at 54 in figure 8.

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Regarding claims **9**, Arena is silent on programming and automation means, however it would be obvious to a person of ordinary skill in the art at the time of the invention to automate the manual means for transition because it has been held that broadly providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art *In re Venner*, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958). (See MPEP 2144.04, section III).

Regarding claim **10**, Arena teaches redundant safety elements (the aircraft has two engines; if one goes out the aircraft can still land on the power of the remaining engine).

Regarding claim **11**, Arena teaches an actuator in col. 2, lines 60-65 in the plunger-cylinder operation.

Claim **2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Arena in view of Rostad as applied to claim 1 above, and further in view of US-3986686 to Girard.

Neither Arena nor Rostad teach the preliminary step of retracting the landing gear. However Girard teaches a convertiplane with a step of retracting the landing gear prior to a conversion to fixed-wing flight (Girard col. 5, lines 20-28). It would have been obvious to a person of ordinary skill in the art at the time of the invention to retract the landing gear of Arena as in Girard to reduce drag during fixed-wing flight.

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Claim **3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Arena in view of Rostad as applied to claims 1-2 above, and further in view of US-5915649 to Head.

Arena and Rostad are both silent on operation of aircraft pressurization and heating systems, however Head teaches a cabin with cabin pressurization and heating systems (Head col. 3, lines 41-44; heating is listed, and heating, ventilation and air conditioning are considered to provide some degree of cabin pressurization). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the aircraft pressurization and heating systems of Head in the aircraft of Arena to keep the passengers warm and breathing without undue difficulty at higher altitudes.

Claim **12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Arena in view of Rostad as applied to claims 8-11 above, and further in view of US-5915649 to Head.

Arena and Rostad are both silent on fly by wire technology, however Head teaches a convertiplane utilizing fly-by-wire technology (Head col. 8, lines 7-17). It would be obvious to a person of ordinary skill in the art at the time of the invention to implement fly-by-wire technology as in Head in the convertiplane of Arena to reduce the mechanical complexity of the aircraft.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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US-3490720 to Girard, US-4059247 to Prewitt, and US-3563496 to Zuck are examples of similar convertible airplanes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard R. Green whose telephone number is (571)270-5380. The examiner can normally be reached on Monday - Thursday 7:00 am - 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571)272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Mansen/
Supervisory Patent Examiner, Art Unit 3644

/R. R. G./
Examiner, Art Unit 3644